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Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of	)	
	)	
Radio Technical Commission for Maritime Services	)	RM-_____
	)	
Petition for rulemaking to amend Part 80 of the commissions rules to provide for a digital small message service on certain Maritime VHF channels	)	July 24, 2009

PETITION FOR RULEMAKING

The Radio Technical Commission for Maritime Services (RTCM) hereby requests the Commission to commence a rulemaking to permit a digital small message service on certain Maritime VHF channels. RTCM has recently completed its standard, RTCM 12301.1, "VHF-FM Digital Small Message Services (VDSMS)" [1], which enables transmission of short digital messages without interfering with other communications on the same channel and the adjacent channels. Such services and technology are also addressed in Recommendation ITU-R M.1842-1 and Report ITU-R M.2122 which both reference and recommend the technology developed by RTCM Special Committee 123 (RTCM SC123) that is incorporated in this technical standard.

[1] The RTCM standard, RTCM 12301.1 is attached at ANNEX 2.

VDSMS are designed to be embodied within an item of equipment capable of receiving and transmitting VHF communication. VDSMS are intended to provide for short messaging from ship-to-ship, shore-to-ship and ship-to-shore. VDSMS are intended to operate on frequencies in the international VHF Marine Band defined in Appendix 18 of the International Radio Regulations (RR Ap 18), unless otherwise restricted by regulation. VDSMS may share channels with other services (e.g. voice services) on a non-interference basis.

RTCM considers digital messaging in the VHF Maritime Mobile Radio Service to be an urgent need for many reasons, including, but not limited to the following:

1. Digital messages are sent with much better spectrum efficiency than verbal messages because they occupy significantly less time. In this case, only 150 milliseconds is needed to transmit information that could literally take minutes to describe and verify in a verbal conversation.
2. Digital messages are accurately transmitted and are not likely to be misunderstood or in need of repetition for lack of clarity or intelligibility.
3. Digital messages can be automatically acknowledged by the receiving station and repeated if necessary to insure reception.
4. Digital messages can be left on the message screen to be verified, copied and/or recorded.

5. There is a serious lack of communications channels in the VHF Maritime Mobile Service, especially in the United States.
6. The proposed VDSMS application does not compete with, interfere with or disrupt the current use or users of the VHF Maritime Mobile Radio Service communications channels.

Background:

The RTCM is a non-profit organization whose objectives include studying and preparing reports on maritime electronic navigation and telecommunications practices. Our focus is on needs and technologies with a view toward improving efficiency and capabilities of maritime electronic navigation and telecommunications services, suggesting ways to keep rules and regulations to the minimum essential for effectiveness, and making recommendations on important issues. Established by the U.S. government in 1947 to support technical decision-making in the area of maritime radiocommunications, RTCM is now a membership organization[2] that supports and encourages needed improvements in maritime communications and electronic navigation. RTCM technical standards have been widely incorporated in the FCC Part 80 rules, they have served as international standards, and they have been used as the basis for many more ITU and IEC international technical standards used in the maritime services.

[2] RTCM membership is comprised of the maritime stakeholders from the US and foreign governments, marine equipment manufacturers, maritime communications service providers, marine dealers and distributors, US government contractors, technical standards organizations, technical service organizations, marine pilots organizations, marine transportation services, marine insurance providers and many other interested parties in the marine industry in the US and abroad.

RTCM notes that digital messaging (e.g., text messaging) is widely used in the various wireless services, including cellular telephony, due to its most efficient use of the radio spectrum. It is also noted that the FCC Part 80 rules do not currently provide for VHF data transmission except for one channel in Alaska (channel 68) and for the VHF Public Correspondence (VPC) services, and that a technical standard is needed to insure interoperability.

At its May 2005 Annual Meeting, at the request of its members, to insure the most efficient use of the VHF marine spectrum and with the assurance that this was in the best interests of the marine industry and the general public[3], the RTCM Board of Directors convened Special Committee 123 (RTCM SC123), comprised of radiocommunications technical experts from the marine industry around the world, for the purpose of developing a technical standard for the transmission of digital small messages in the marine VHF-FM band.

The RTCM SC123 contributed to the development of an international technical report on electromagnetic compatibility (EMC) in the marine VHF band, Report ITU-R M.2122, which includes and references the work of RTCM SC123, and an international technical standard, Recommendation ITU-R M.1842-1, which also includes and references the work of RTCM SC123. Subsequently, and in accordance with these and other relevant international reports and standards, the RTCM has recently completed its standard,

[3] Recommendation ITU-R M.1842-1 has considered that IMO has stated that the maritime industry has need for safe, fast and inexpensive communications for business and safety. At IMO the future need for harmonization of systems using maritime VHF channels was considered, and ITU-R has been informed of the possible future need for worldwide systems for the exchange of data and electronic mail on maritime VHF channels.

RTCM 12301.1, "VHF-FM Digital Small Message Services (VDSMS)", which enables transmission of short digital messages without interfering with other communications on the same channel. Such services are addressed in Recommendation ITU-R M.1842-1.

RTCM's proposal:

Radio Technical Commission for Maritime Services (RTCM) proposes that the Commission commence a rulemaking to permit digital small message services on certain Maritime VHF channels. VDSMS are designed to be embodied within an item of equipment capable of receiving and transmitting VHF communication. VDSMS are intended to provide for short messaging from ship-to-ship, shore-to-ship and ship-to-shore. VDSMS are intended to operate on frequencies in the international VHF Marine Band defined in Appendix 18 of the International Radio Regulations (RR Ap 18), unless otherwise restricted by regulation. VDSMS may share channels with other services (e.g. voice services) on a non-interference basis.

The channel access method that uses "white space" for VDSMS is intended to ensure that a call in progress is not disrupted by monitoring a channel to ensure that it is not in use before transmitting data, which is consistent with the FCC's current "listen-before-talk" rule. VDSMS transmissions are designed to co-exist on the same channel with voice communications, and they thus have a duration limited to 150 milliseconds and a duty cycle which limits transmissions to no more than once per second to ensure the availability of the channel for the other users.

RTCM proposes the following revision to 47 CFR Part 80:

Revise §§ 80.351 and 80.361 to

- incorporate RTCM 12301.1 by reference; and
- allow access to voice channels for RTCM 12301.1 data except for the maritime safety and security channels and other channels excluded under footnote *b)* of Appendix 18 of the Radio Regulations, as well as designated VTS channels in the VTS areas.

The class of emission required for VDSMS (F1D) is already permitted under § 80.207(d) for frequencies in the 156-162 MHz band.

Proposed revisions to §§ 80.351 and 80.361 are attached at Annex 1.

Conclusion:

RTCM urges the FCC to amend its Part 80 rules accordingly so as to provide an approved means for implementing this valuable service.

For the Radio Technical Commission for Maritime Services

R. L. Markle
President

ANNEX 1

Proposed revisions to 47 CFR 80.351 and 80.361 to permit VDSMS service on maritime mobile frequencies

By revising section 80.351 to read as follows:

§ 80.351 Scope.

The following sections describe the carrier frequencies and general uses of radiotelegraphy with respect to the following:
—Distress, urgency, safety, call and reply.
—Working.
—Digital selective calling (DSC).
—Narrow-band direct-printing (NB-DP).
—Facsimile.
—VHF-FM digital small message services (VDSMS).

By adding a new section 80.361(e) to read as follows:

§ 80.361 Frequencies for narrow-band direct-printing (NBDP), radioprinter and data transmissions.

* * * * *

(e) *VHF-FM Digital Small Message Services*. Frequencies in the 156-162 MHz band may be used for VHF digital small message services (VDSMS) complying with RTCM Standard 12301.1 with the following exceptions:

VHF-FM CHANNELS NOT AVAILABLE FOR DIGITAL SMALL MESSAGE SERVICE

Channel	Frequency (MHz)
06	156.300
67	156.375
70[4]	156.525
13	156.650
15	156.750
75	156.775
16	156.800
76	156.825
17	156.850
22A	157.100
AIS 1/2[5]	161.975/162.025

[4] RTCM Standard 12301.1may be included within an item of equipment capable of receiving and transmitting VHF communication, including DSC; however, because Channel 70 is the dedicated DSC distress and calling channel, Channel 70 may be used for calling purposes but not for RTCM Standard 12301.1 digital messages.

(1) Unless authorized by the U.S. Coast Guard, VDSMS is also prohibited in designated U.S. Coast Guard Vessel Traffic Service areas on frequencies reserved for those services under § 80.373(f) of this Part.

(2) RTCM Standard 12301.1 is incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of this standard can be inspected at the Federal Communications Commission, 445 12th Street, SW., Washington, DC (Reference Information Center) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: http://www.archives.gov/federalregister/codeoffederalregulations/ibrlocations.html. RTCM standards can be purchased from the Radio Technical Commission for Maritime Services (RTCM), 1800 N. Kent St., Suite 1060, Arlington, VA 22209-2109, www.rtcm.org.

[5] RTCM Standard 12301.1 may be included within an item of equipment capable of receiving and transmitting VHF communication, including AIS; however, because AIS1 and AIS2 are the dedicated AIS channels, these channels may be used in accordance with Recommendation ITU-R M.1371-3 for calling purposes but not for RTCM Standard 12301.1 digital messages.

ANNEX 2

RTCM 12301.1
RTCM Paper 151-2009-SC123-STD

RTCM STANDARD 12301.1

VHF-FM DIGITAL SMALL MESSAGE SERVICES

DEVELOPED BY
RTCM SPECIAL COMMITTEE NO. 123

JULY 10, 2009

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The RTCM does not engage in the design, sale, manufacture or distribution of equipment or in any way control the use of this standard by any manufacturer, service provider, or user. Use of, and adherence to, this standard is entirely within the control and discretion of each manufacturer, service provider, and user.

For information on RTCM Documents or on participation in development of future RTCM documents contact:

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RTCM STANDARD 12301.1

VHF-FM DIGITAL SMALL MESSAGE SERVICES

DEVELOPED BY
RTCM SPECIAL COMMITTEE NO. 123

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RADIO TECHNICAL COMMISSION FOR MARITIME SERVICES

RTCM STANDARD 12301.1

VHF-FM Digital Small Message Services

1 Scope

This standard specifies the minimum functional and technical requirements for VHF-FM Digital Small Message Services (VDSMS). VDSMS are designed to be embodied within an item of equipment capable of receiving and transmitting VHF communication. This is not an equipment standard.

VDSMS are intended to provide for short messaging from ship-to-ship, shore-to-ship and ship-to-shore.

VDSMS are intended to operate on frequencies in the international VHF Marine Band defined in Appendix 18 of the International Radio Regulations (RR Ap 18), unless otherwise restricted by regulation. VDSMS may share channels with other services (e.g. voice services) on a non-interference basis. The VHF Data Link (VDL) access method for VDSMS is intended to ensure that a call in progress is not disrupted.

VDSMS transmissions have a limited duration and a limited duty cycle to ensure the availability of the channel for other users. VDSMS transmitter emissions masking is intended to protect the users of the adjacent channels.

The body of this standard includes general requirements for VDSMS, e.g. operating frequencies, channel access method, limitations on the use of white space in the radio channels, transmitter emissions mask, receiver characteristics, and electromagnetic compatibility (EMC) with other radio systems in the geographical/spectral vicinity of the VDSMS. Requirements for the two specific technology implementations (the 9600 BPS modulation used in Recommendation ITU-R M.1371-3 and the 43200 BPS π/8 D8PSK modulation used in Recommendation ITU-R M.1842 Annex 1) will be contained in future separate Annexes that will include packet data structure, message types, error detection/correction and other technical details associated with each technology.

2 Normative references

The following referenced documents apply to this standard only to the extent specified herein.

IEC 61993-2, *Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 2: Class A shipborne equipment of the universal automatic identification system (AIS) – Operational and performance requirements, methods of test and required test results*

IEC 62238, *Maritime navigation and radiocommunication equipment and systems – VHF radiotelephone equipment incorporating Class "D" Digital Selective Calling (DSC) – Methods of testing and required test results*

International Radio Regulations (RR)

Recommendation ITU-R M.1080, *Digital selective calling system enhancement for multiple equipment installations*

Recommendation ITU-R M.1084-4, *Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service*

Recommendation ITU-R M.1371-3, *Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band*

Recommendation ITU-R M.1842, *Characteristics of VHF radio system and equipment for the exchange of data and electronic mail in the maritime mobile service RR Appendix 18 channels*

Report ITU-R M.2122, *EMC assessment of shore-based electronic navigation (eNAV) infrastructure and new draft Standards for data exchange in the VHF maritime mobile band (156-174 MHz)*

Recommendation ITU-R M.585, Assignment and use of maritime mobile service identities (MMSI)

3 Definitions, acronyms and abbreviations

3.1 Definitions

The following terms are used in this standard:

3.1.1 Shall

describes attributes which RTCM considers necessary to meet the standard. However, the use of the term "shall" is not intended to limit the possibility of amending the standard through the language of a regulation or contract which incorporates this standard by reference. If a VDSMS is implemented to such an amended standard, any claim of compliance with this standard shall also be accompanied by a description of the modification.

3.1.2 Should

describes attributes recommended by RTCM, but not mandatory to claim compliance with this standard.

3.1.3 VHF-FM Digital Small Message Services (VDSMS)

a maritime digital small messaging service that uses white space and limited duty cycle in a channel in the VHF maritime mobile band to transmit and receive digital messages between ships and between ships and shore stations.

3.1.4 White space

an interval of time in which a radio channel is unused.

3.2 Acronyms and abbreviations

The following acronyms and abbreviations are used in this standard.

AIS	Automatic Identification System
EMC	Electromagnetic Compatibility
FM	Frequency Modulation
IEC	International Electrotechnical Commission
ITU	International Telecommunications Union
MMSI	Maritime Mobile Service Identity
PEP	Peak Envelope Power
ppm	parts per million
RSL	Received Signal Level

VDL VHF Data Link
VDSMS VHF-FM Digital Small Message Service
VHF Very High Frequency

4 General Requirements

Values specified in this standard shall be within +/- 30 ppm unless otherwise stated or specified in the referenced standard.

4.1 Operating frequencies

VDSMS is intended to operate on frequencies in the VHF Marine Band 156-162 MHz.

VDSMS is intended to operate from ship-to-ship, ship-to-shore and shore-to-ship.

4.2 Operating channels

VDSMS may operate on both simplex and duplex channels as specified in Recommendation ITU-R M.1084-4.

VDSMS may share a channel with other services (e.g. voice services).

VDSMS equipment shall have the capability to select the operating channel.

4.2.1 Determining the availability of a channel

Prior to every transmission attempt except an acknowledgement or a hand-shake, VDSMS shall measure the Received Signal Level (RSL) for 2 milliseconds to determine the availability of a channel. Prior to using a channel, the RSL shall be monitored for one minute to determine the channel's "noise floor." After the first one minute, the channel shall be continuously monitored and the "noise floor" shall be reset based on the last one minute of channel monitoring. The channel's "noise floor" shall be defined as the lowest RSL measured in any consecutive 2 millisecond interval over the last one minute. The channel shall be considered "available" whenever its RSL is within 10 dB of the "noise floor.

When VDSMS determines by RSL measurement that a channel is not available, it shall delay its pending transmission attempt by a pseudo-random time period of between 26 milliseconds and 100 milliseconds, in 2 millisecond increments after the channel becomes available. The intended transmission shall be aborted if it is not sent within 10 seconds.

For a transmission in response to a message requesting acknowledgement or hand-shake, VDSMS shall respond within 24 milliseconds without RSL measurement delay.

4.2.2 Limiting the use of a channel

VDSMS shall limit the duration of each transmission to a maximum of 150 milliseconds.

VDSMS shall wait at least one second between successive transmissions except in the case of acknowledgements and one hand-shake for transmission set-up.

4.3 Transmitter

4.3.1 Emissions spectrum

VDSMS shall use the transmitter modulation emissions mask specified in IEC 61993-2 to protect adjacent channels.

VDSMS transmitter attack and decay times shall be as specified in IEC 61993-2.

Transmitter power for VDSMS mobile equipment shall not exceed 25 watts PEP, measured at the output connector of the equipment.

Transmitter power for VDSMS base station equipment shall not exceed 50 watts PEP, measured at the base of the antenna.

4.3.2 Modulation

Transmitter modulation for VDSMS equipment shall be as specified in Recommendation ITU-R M.1371-3 or ITU-R M.1842 Annex 1.

4.3.3 Automatic shutdown

VDSMS transmitter equipment shall automatically shut down in the case of a fault where the transmitter does not discontinue its transmission within 1 second of the end of its nominal transmission.

4.4 Receiver

Receiver performance for VDSMS transmit/receive equipment shall be as specified in IEC 62238 including Annex D, unless otherwise specified herein.

Minimum static RSL measurement receiver sensitivity for VDSMS transmit-only equipment shall be as specified in Recommendation ITU-R M.1842 Annex 1 for the applicable transmitter modulation.

4.5 Electromagnetic compatibility

Electromagnetic compatibility (EMC) with other services in RR Ap 18 shall be assured in accordance with Report ITU-R M.2122. Implementation issues between the services (e.g. timing and protocol) shall also be considered in accordance with the relevant standards for the other services.

4.6 Identification

VDSMS shall use the Maritime Mobile Service Identity (MMSI) number to identify the maritime mobile service station in accordance with Recommendation ITU-R M.585, including the use of the tenth digit as specified in Recommendation ITU-R M.1080.

4.7 Indications

At a minimum, VDSMS transmit/receive equipment shall provide the following indications:

a) Power On/Off

b) Standby/Ready

Annex A
(informative)

Intellectual Property

A.1 Policy

It is the intent of the Radio Technical Commission for Maritime Services (RTCM) to develop standards that do not require the use of patented technologies as the only means to comply with a standard (essential patents).

A.2 Essential patented technologies

RTCM has not been informed of any patented technologies that must be used in order to design or produce equipment covered by this standard.

A.3 Non-essential patented technologies

RTCM has been informed of the patented technologies listed in Table A.1 that may be used in the design and production of equipment covered by this standard. However, RTCM believes it is possible to design and produce equipment covered by this standard without using any of the patented technologies listed in the table.

Table A.1 is provided for the information of users of this standard. RTCM takes no responsibility for the accuracy or completeness of this list.

Table A.1 – Non-essential patents

Issuing Country	Patent Number	Patent Holder	Brief Description (See Note)
USA	7512095	Mark Johnson, Andreas Lesch [1]	Multiple Access Communication System for Moveable Objects.

NOTE: Do not rely on this summary as a complete description of the technology. See patent documents for a full description.

[1] Patent holder or related organization is a member of RTCM and Special Committee 123.